

4. EV Board Schematic

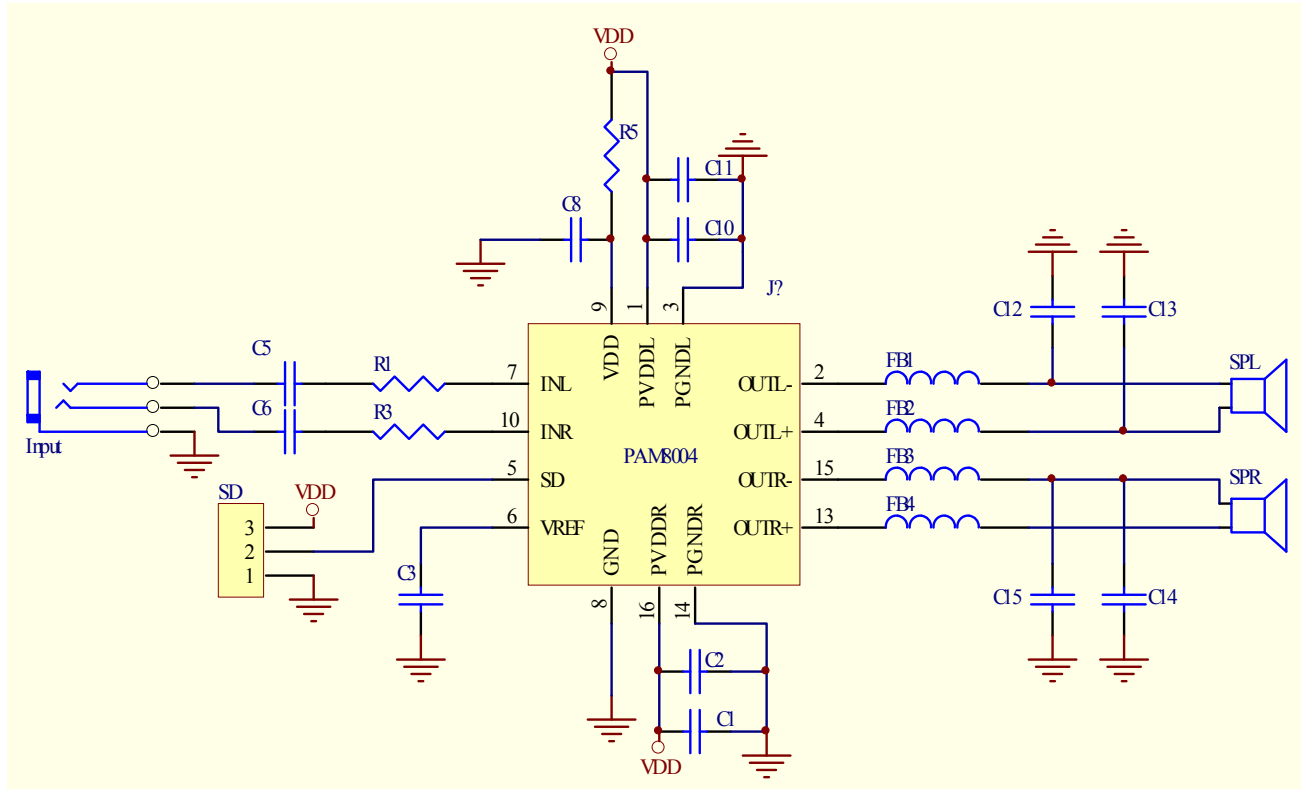


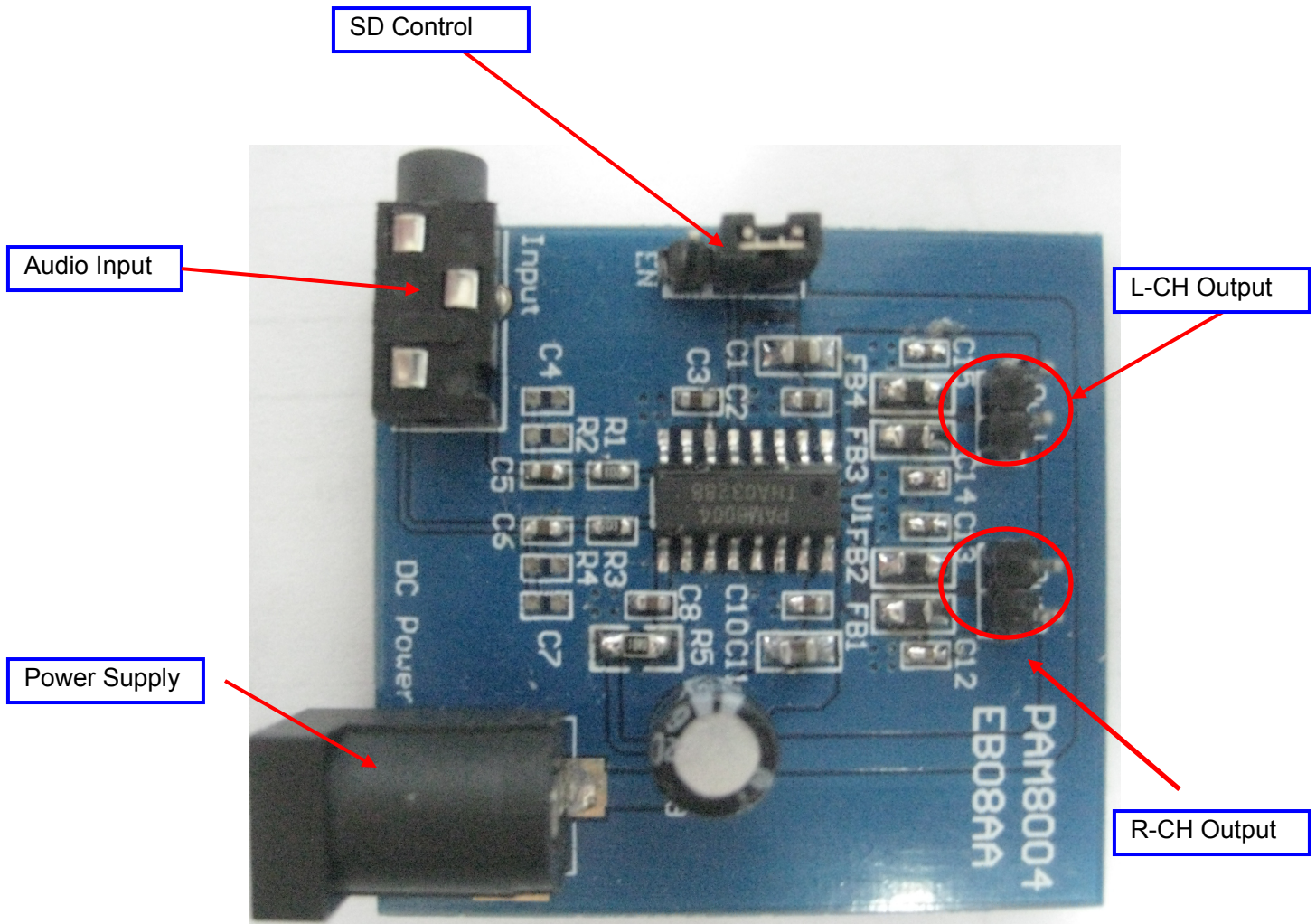
Figure 1

5. EVB PAM8004 EVB EB08AA Description

PAM8004 EB08AA is an evaluation board for the PAM8004, a stereo class-D audio power amplifier. The board is targeted to be used in providing a simple and convenient evaluation environment for the PAM8004. Requires parts, the standard RCA jacks for audio inputs, pin jacks for power supply and signal outputs etc. on the board make it easy to be evaluated.

6. EV Board View and Jack Description

Top Layer



EV Board Operational Sequence:

- Connect SD to a high for normal operation
- Connect audio input from audio input jack
- Connect the loading(speaker or power resistor) to the output jack
- Power on: 2.5V to 5.5V DC power supply

7. EV Board BOM List

Item	Value	Type	Rating	Description
C5,C6	1 μ F	X5R/X7R, Ceramic/0603	10V	Input coupling CAP
C2,C10	1 μ F	X5R/X7R, Ceramic/0603	25V	PVDD coupling CAP,
C1,C11	10 μ F	X5R/X7R, Ceramic/0805	25V	PVDD main coupling CAP,
C3	1 μ F	X5R/X7R, Ceramic/0603	10V	Internal 2.5V bias decoupling CAP
C8	1 μ F	X5R/X7R, Ceramic/0603	25v	AVCC coupling CAP
R1, R3	5.1k	0603	1%	Input Resistor
FB1,FB2,FB3,FB4	200 Ω	0805	2A	For EMI eliminate components form a FB-CAP filter
C12,C13,C14,C15	220pF	0603	25V	
C9	470 μ F	Electrolytic	16V	Power supply decoupling CAP
R5	10 Ω	0805	5%	Separate AVCC from PVDD

8. External Components Selection

Input Capacitors (C5, C6)

- (1) Form a high pass filter with R_i , and the cut off frequency is $f_c = 1/2 * \pi * R_i * C_i$
- (2) Have a tolerance of 10% or better for matching : any mismatch in capacitance causes an importance mismatch at the corner frequency and below
- (3) Low leakage current needed, 1.0 μ F, X5R/X7R ceramic recommend

Input Resistors (R1, R3)

- (1) Limit the closed-loop gain
- (2) Form a high pass filter with C_i , and the cut off frequency is $f_c = 1/2 * \pi * R_i * C_i$
- (3) 1% tolerance needed for resistor matching to improve CMRR, PSRR

Power Supply decoupling Caps (C1, C2, C10, C11, C8)

- (1) Low ESR for good THD, PSRR
- (2) 1 μ F ceramic for higher frequency transients, spikes, or digital hash on the line of PVDD/AVCC
- (3) Additional 10 μ F or greater for low frequency noise filtering and serves as a local storage capacitor for supplying current during large signal transients on the amplifier outputs
- (4) Need place very closed to the IC

8. External Components Selection (cont.)

Internal 2.5V Bias Supply Capacitor (C3)

- (1) Internal power supply for pre-amplifier,
- (2) 1uF, X5R/X7R ceramic recommend
- (3) Place very closed to the device

EMI Eliminate Filter (FB1, FB2, FB3 and FB4)

- (1) High impedance at high frequency and very low impedance at low frequency
- (2) The current rating is higher than 2A

9. PCB Layout Guidelines

Grounding

- (1). Use plane grounding or separate grounds
- (2). Do not use one line connecting power GND and analog GND
- (3). Output noise grounds must tie to system ground at the power in exclusively.
- (4). Signal currents for the inputs need to be returned to quite ground. This ground only ties to the signal components and the GND pin.

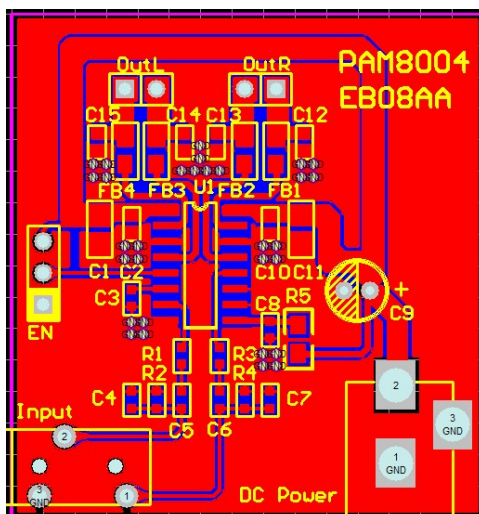
Power Supply

Others

- (1). The power supply capacitors (C1, C2, C10, C11,C8) need to place very close to the PAM8003's pins.
- (2). Input capacitors (C5, C6) place closed to input pin as near as possible.

10. PCB Layout Example

Top Layer



Bottom Layer

